IWSM **Policy Brief**

March 2014

Watersheds in Muminabad: the upper zone has been extensively logged and grazed, the middle zone is covered with smallholder plots, and the lower zone is under intensive cultivation. *Photo: Hanspeter Liniger (2012)*

Integrated watershed management in Tajikistan

Tajikistan is preparing to reform its water sector to more efficiently manage water resources. This policy brief contributes relevant insights from Swiss-funded integrated watershed management initiatives in Tajikistan. While sustainable land management practices help conserve the productive and protective properties of agricultural areas in hazard-prone regions, this requires careful consideration of the full range of land management technologies and approaches in the upper, middle and lower zone of the watershed. Successful examples from Tajikistan and other countries can be used for effective community management of watersheds to increase both production and protection against disasters such as flash floods, landslides, and dry spells.

POLICY MESSAGES

- *Sustainable land management practices support integrated watershed management, and help to meet key human needs through disaster risk reduction, increased agricultural production, greater livelihood security, and the protection of natural resources.*
- *Local knowledge and practices must be adequately reflected and integrated into sustainable land management practices to ensure their effective implementation.*
- *Reforming the water and agrarian sector in Tajikistan will require the integration of community-based approaches that support localized watershed management.*

Need for integrated watershed management (IWSM) in Tajikistan

Tajikistan is highly vulnerable to natural hazards that can cause disasters. Due to its mountainous character, the country frequently experiences rainfall-related disasters, such as floods, debris flows, landslides, dry spells, and droughts. However, despite the latent risk of disasters, people inhabit and over-exploit the land in vulnerable watershed areas. Farming and firewood collection often take place in ecologically fragile areas, such as the upper zones of watersheds, where soil and water conservation practices are necessary to maintain the land's productive capacity. Inadequate land management practices result in degradation and increased water runoff, which consequently alters the water

Table 1: **Typical watersheds in Tajikistan: zones, characteristics, and SLM options (based on GIZ 2012)**

		Upper zone	Middle zone	Lower zone
Natural environment	Climate	Sub-humid with seasonal rainfall and inter-seasonal heavy rainfall events	Semi-arid, temperate with seasonal rainfall	Semi-arid, temperate with seasonal rainfall
	Land form	Mountainous, steep slope	Hilly, moderate slope	Plain, gently sloping or flat
	Type of soil	Shallow stony soil	Deep, fairly fertile colluvial soil	Fertile alluvial soil
Human environment	Accessibility	4-8 km from the village	2-4 km from the village	0-2 km from the village
	Land use rights	State and communal	Communal and individual	Individual and leased
Land use	Land use types	Grazing land and forests	Rainfed cropland, mixed areas and grazing land	Settlements, irrigated cropland, grazing land
	Degradation causes	Overgrazing, deforestation	Inappropriate cropland management, deforestation, overgrazing	Runoff concentration, sediment accumulation
Effects on natural resources	Land degradation types	• Reduction in vegetation cover • Loss of topsoil due to water and wind erosion	• Reduction in vegetation cover • Loss of topsoil due to water erosion, gully erosion • Decline in fertility	• Riverbank erosion • Decline in fertility • Waterlogging
	Effects on the water balance	• Increased evaporation • Reduced infiltration • Increased runoff (volume contribution 20%-40%)	• Increased evaporation • Reduced infiltration • Increased runoff (volume contribution 60%-80%)	• Runoff (accumulation in flood waterways) • Increasing ground water levels
SLM options	Examples of SLM Technologies and Approaches (WOCAT code)	• Rotational grazing supported by additional water points (T_TAJ100) • Joint forest management (A_TAJ015) • Public women's organization (A_TAJ036) spreading heat exchangers as energy efficiency measure to save fuel wood	• Agroforestry (orchard with intercropping) (T_TAJ043) • Infilling of gullies with vegetative structures (T_TAJ356) • Perennial herbaceous fodder plants for intact canopy cover (T_TAJ009)	• Strengthening of river banks with stones and gabions (T_TAJ403) • Poplar trees for bio-drainage (T_KYR001) • Technical assistance groups (A_TAJ043) for improved management of crops

FEATURED CASE STUDY

The Integrated Watershed Management Initiative (since 2011) is currently being implemented in Tajikistan with Swiss funding. DRR and IWSM projects are underway in Muminabad District, and are just starting in Rasht District and the transboundary Khojabakirgan watershed, which spans Kyrgyzstan and Tajikistan. The knowledge management component is designed to provide state-of-the-art approaches and methods, while facilitating exchange among IWSM practitioners and decision-makers.

IWSM project

The IWSM project being implemented by Caritas Switzerland in Muminabad District aims to address the root causes of natural disasters and reduce the related risks. A comprehensive assessment was conducted to gain in-depth understanding of the selected watersheds, by focusing on topography, soil type, land use, hydrology, erosion, and energy use. During the nine-month inception phase, there was close collaboration between civil society groups and local authorities to develop an action plan, which is updated based on continuous evaluation of the implemented activities.

IWSM and DRR knowledge management

Comprehensive knowledge management supports evidence-based decision-making at multiple levels. This includes participatory community-based SLM planning workshops, exchanges and roundtable discussions about Tajikistan's new Pasture Law, the development of an internet-based knowledge hub, and WOCAT video resources.

balance. Official statistics from the UN and others frequently report widespread land degradation, especially due to erosion, in Tajikistan's upland areas.

Sustainable land management (SLM) practices are one source of viable tools and approaches to address conflicts that arise in watershed areas between human activities and environmental protection measures.

How does SLM protect watersheds and provide disaster risk reduction (DRR)?

SLM can increase land productivity, improve livelihoods, and protect ecosystems. All of these factors enhance the resilience of rural communities to extreme weather events and effects of climate change, and support DRR by reducing their vulnerability. As a result, transitioning to SLM practices is regarded as a viable pathway to addressing environmental and economic challenges in watershed areas.

To efficiently address land degradation problems in the different watershed zones, SLM technologies and approaches must be carefully selected based on the required protective functions. Using tools provided by the World Overview of Conservation Approaches and Technologies (WOCAT), experts have documented and analysed existing SLM practices in Central Asia and worldwide. WOCAT's online database currently contains more than 100 SLM technologies and approaches from Central Asia, and a total of over 600 entries from around the world. These SLM practices offer adaptation opportunities for a diverse range of land uses. Table 1 describes the challenges of a typical watershed in Tajikistan, and how SLM could make it more resilient to natural hazards.

Land management practices in the watershed's middle zone: unsustainable land management practices have led to degraded hillsides in the background, while SLM practices are visible in the foreground. *Photo: Malgorzata Conder (2012)*

Community-based planning for integrated watershed management in Muminabad.
Photo: Hansperet Liniger (2012)

In addition to selecting and adapting SLM practices for local conations, proper implementation of SLM measures requires the participation of all relevant stakeholders, including individual and community land users, scientists, governmental officials, and members of civil society. Taking local stakeholder perceptions and knowledge into account is crucial to ensure that the management of watersheds is "integrative" and strengthens local capacities in the long-term.

Benefits of SLM over common practices in Tajikistan

Over the past years, the Swiss Agency for Development and Cooperation (SDC), Caritas Switzerland, and the Centre for Development and Environment (CDE) of the University of Bern have been actively propagating and assessing ways to effectively implement IWSM in Tajikistan.

This IWSM initiative works in Obishur and Chukurak, two different watersheds of Muminabad District. A comparative study was conducted assessing costs and benefits of SLM practices and common practices (CP) for three different land use types - cropland, orchard, and pasture. The following characteristics and their respective indicators (in parentheses) were used to reveal SLM benefits: runoff reduction (modelled value), productivity (yield data collected through interviews) and soil quality (organic carbon in soil based on soil samples). Implementation and maintenance costs, as well as labour and expenses, were differentiated in the cost-benefit analysis. Results show that in both sites, SLM practices are positive for the cultivation of crop and pasture based on a cost-benefit analysis. This short-term scenario does not include orchards, where SLM practices only provide a net benefit over the long-term.

Policy situation in Tajikistan on IWSM and related DRR

Currently, an explicit IWSM policy is not in place in Tajikistan. There are, however, ongoing efforts to reform the water sector and implement an Integrated Water Resource Management (IWRM) approach, which would provide the foundations for implementing a comprehensive IWSM strategy. This water sector reform process is being supported by Switzerland along with other international partners. Apart from the ongoing water sector reform, the 2010 adoption of the National Disaster Risk Management Strategy indicates the government's commitment to take DRR measures aimed at protecting people and the natural environment from disasters.

Active multi-stakeholder participation, including local actors in particular, is crucial for ensuring the success of both reforms to the water sector and implementation of the disaster risk management policy. In this case, local actors have shared their insights about farming practices and other issues during workshops, and this information has been directly integrated into the development and formulation of plans and strategies for sustainably managing their watershed.

A three-step process should be used to ensure the active engagement of local stakeholders in creating successful IWSM strategies in Tajikistan. Firstly, the natural and human aspects of the local environment should be assessed. This is followed by an evaluation and selection of SLM practices that suit the specific context. Finally, there should be continuous monitoring as the SLM practices are implemented.

This process should not only ensure that local stakeholders and communities are actively engaged, but should also foster effective knowledge management in terms of the generation, collection and dissemination of relevant information.

DEFINITIONS

- Watershed management is the integrated use of land, vegetation and water in a geographically discrete catchment or drainage area for the benefit of its residents, with the objective of maintaining the hydrological services that the watershed provides and of reducing or avoiding negative downstream or groundwater impacts (adapted from World Bank 2008).
- Watersheds consist of three distinct zones (Figure 1). In the upper zone, rainwater falls onto steep mountain slopes before streaming downward through narrowly shaped creeks and valleys. In the middle zone, water traverses foothills with moderate slopes and begins to meander. In the lower zone, water streams enter into plain areas and the end of their hydrological cycle, where they intersect with other streams, and ultimately flow into the sea or enter the groundwater (Miller 1990).

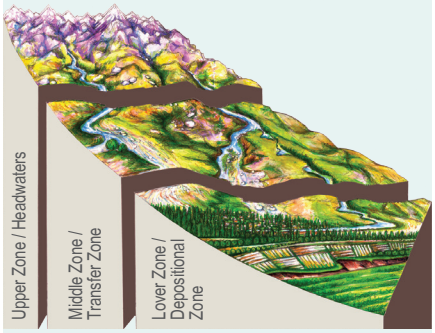

Figure 1. **Watershed zones**

- Sustainable land management (SLM) is the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and ensuring their environmental functions (WOCAT 2007).
- Disaster risk reduction (DRR) is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR 2009).

IWSM CHAMPION ISKANDAR MIRZOEV

Fruit farmer Iskandar Mirzoev has created a small paradise in a badly degraded micro-watershed in Tajikistan's Faizabad District. He manages to cope with extreme weather events and dry years by grafting trees: [if one variety does not produce, another one will]. He also protects his land from heavy rainfall by planting trees on the slopes and bed of the gully to stop fertile soil from being lost.

WOCAT documentation of Iskandar Mirzoev's management activities:

- Gully rehabilitation with native trees: http://qt.wocat.net/qt_summary.php?lang=English&qt_id=686
- Orchard-based agroforestry (establishment of orchard): http://qt.wocat.net/qt_summary.php?lang=English&qt_id=260

WOCAT videos featuring Iskandar Mirzoev:

- Building resilience – people with greener land: https://www.youtube.com/watch?v=wy4qosshXT8
- Orchard based agroforestry: http://www.youtube.com/watch?v=f8JQZmO14ig&feature=youtu.be

FURTHER READING

Government documents:

- Water sector reform document http://www.mwr.tj/ru/library/planes/
- Land code http://mmk.tj/ru/legislation/legislation-base/codecs/
- Forest code http://mmk.tj/ru/legislation/legislation-base/codecs/
- Pasture law http://mmk.tj/ru/legislation/legislation-base/250/

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POLICY IMPLICATIONS OF THE IWSM INITIATIVE

SLM practices provide viable solutions

Effective IWSM and DRR can be delivered through sound SLM practices that take local context into account and incorporate local people's knowledge about cultivation practices. In the context of climate change and implementing the adopted DRR strategy, efforts need to be intensified to mainstream SLM in watershed areas in Tajikistan. Similar efforts are also needed in other Central Asian countries. Collaboration with international partners can provide much needed technology transfer and funding to support this process.

Spreading SLM practices requires a community-based approach

Recent projects in watershed areas in Tajikistan have found that effective mainstreaming of SLM practices requires the participation and involvement of local stakeholders, as well as the institutionalization of such approaches. Not only do they provide local knowledge about farming practices and local conditions (hazard exposure, soil quality, disaster history, etc.), they are also key actors when it comes to adopting better land management practices and thus implementing national and regional policies related to watershed management and DRR. A community-based approach is therefore needed, allowing local actors to participate in the decision-making process for local plans and strategies over the long run.

Need for water sector reform that incorporates IWSM

The on-going water sector reform in Tajikistan needs to reflect aspects of knowledge management and local stakeholder participation in effective IWSM planning. This process must fully consider and seek to optimize both the human interests in engaging in economic activities like farming in ecologically and topographically sensitive areas, and demands for environmental conservation.

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